No. 9300266

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Purdue University

Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS ...SS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS ... BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Grant'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D.C. *this* 30th *day of* September *in the year of our Lord one thousand nine hundred and* ninety-four.

Attest:

Kenneth R Evans

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Mike Espy

Secretary of Agriculture

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order t determine if a plant variety protectio certificate is to be issued (7 U.S.C. 2421 Information is held confidential unt certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Director, Purdue University Agricultural Experiment Station

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.
P811670A9-10-6-7-63

3. VARIETY NAME
Grant

4. ADDRESS *(street and no. or R.F.D. no., city, state, and ZIP)*
1140 Ag Administration Bldg
West Lafayette IN 47907-1140

5. PHONE *(Include area code)*
(317) 494-8362

1

FOR OFFICIAL USE ONLY

PVPO NUMBER
9300266

FILING Date: July 9, 1993
Time: 4:00 ☐ A.M. ☒ P.M

6. GENUS AND SPECIES NAME
Triticum aestivum

7. FAMILY NAME *(Botanical)*
Gramineae

8. CROP KIND NAME *(Common Name)*
Wheat

9. DATE OF DETERMINATION
13 August 1992

FEES RECEIVED
Filing and Examination Fee: $ 2325.00
Date: July 1, 1993
Certificate Fee: $ 275.00
Date: Sept. 15, 1994

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Agricultural Experiment Station, Purdue University

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Established by Federal Law (Hatch Act)

12. DATE OF INCORPORATION
1889

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Dr. Eldon E. Ortman
Purdue University, Indiana Ag Experiment Station, 1140 Ag Administration Bldg
West Lafayette IN 47907-1140

PHONE *(Include area code)*: (317) 494-8362

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow INSTRUCTIONS on reverse)*

a. ☒ Exhibit A, Origin and Breeding History of the Variety
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety.
d. ☒ Exhibit D, Additional Description of Variety.
e. ☐ Exhibit E, Statement of the Basis of Applicant's Ownership.
f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office 29 Jun 93
g. ☐ Filing and Examination Fee ($2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See section 83(a) of the Plant Variety Protection Act.)*
☒ YES *(If "YES," answer items 16 and 17 below)* ☐ NO *(If "NO," skip to item 18 below)*

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ FOUNDATION ☐ REGISTERED ☒ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES *(If "YES," through* ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE
Eldon Ortman	Associate Director	29 Jun 93
SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE

9300266

'Grant' AAA 8 July 1994

13 A. Exhibit A. Origin and Breeding History of ~~P811670A9-10-6-7-63~~

P811670A9-10-6-7-63 (PI 562658) was developed by the Purdue University Agricultural Experiment Station in cooperation with the USDA-ARS. P811670A9-10-6-7-63 was selected from a cross of Caldwell//Beau/Kavkaz. Caldwell and Beau are soft red winter wheat cultivars adapted to Indiana. Kavkaz is a Russian winter wheat cultivar having a 1B-1R translocation with resistance to leaf rust and powdery mildew from rye. The cross was made and subsequent selection was carried out to add resistance to leaf rust and powdery mildew from Kavkaz, and large kernel size from Beau and Kavkaz to Caldwell. Subsequent to the final cross, P811670A9-10-6-7-63 was developed by a modified pedigree method of breeding with plant selections made in the F3, F4, F5, and F8 generations. Breeder seed, produced in 1992, is the F12 generation.

P811670A9-10-6-7-63 or its closely related and indistinguishible parent line, P811670A9-10-6-7, has been tested in replicated performance trials at Lafayette, Indiana since 1987; at Sullivan, Indiana since 1991; in Indiana drill plot trials since 1991, in the 4-state (Illinois, Indiana, Missouri, Ohio) Regional Nursery in 1989 and 1991, and in the Uniform Eastern Soft Red Winter Wheat Nursery in 1992. It has also been tested in disease nurseries at Lafayette since 1985, and its soft wheat milling and baking characteristics have been evaluated since 1988.

P811670A9-10-6-7-63 has been uniform and true breeding during development of Breeder seed. Variants have not been observed in F10, 1990; F11, 1991; F12, 1992; or F13, 1993; except that up to 0.2% of spikes are 10 cm taller than other spikes.

13 B. Exhibit B. Novelty Statement

'Grant' AMA 12 Aug 1994

~~P811670A9-10-6-7-63~~ is most similar to Caldwell in plant type. It differs from Caldwell in the following characteristics: the new line has resistance to powdery mildew and leaf rust (gene Lr26) from Kavkaz; it is resistant to soil borne mosaic, Caldwell is susceptible; it has gene Sr31 for resistance to stem rust, Caldwell has gene Sr17.

FORM APPROVED: OMB NO. 40-R3822

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
Dr. B. R. Baumgardt, Director

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
Agricultural Experiment Station
Purdue University
West Lafayette, IN 47907

FOR OFFICIAL USE ONLY

PVPO NUMBER
9300266

VARIETY NAME OR TEMPORARY DESIGNATION
~~P811670A9-10-6-7-63~~ 'Grant' 12 Aug 1994

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:
[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:
[2] 1 = SPRING 2 = WINTER 3 = OTHER *(Specify)* _____
[1] 1 = SOFT 2 = HARD 3 = OTHER *(Specify)* _____
[2] 1 = WHITE 2 = RED 3 = OTHER *(Specify)* _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:
[2][2][9] FIRST FLOWERING
[2][3][5] LAST FLOWERING

4. MATURITY *(50% Flowering)*:
[0][1] NO. OF DAYS *EARLIER* THAN .....
[---] NO. OF DAYS *LATER* THAN .....
[1] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS
[--]

5. PLANT HEIGHT *(From soil level to top of head)*:
[0][8][9] CM. HIGH
[---] CM. TALLER THAN .....
[0][6] CM. SHORTER THAN .....
[---]
[1] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING *(See reverse)*:
[2] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:
[1] 1 = YELLOW 2 = PURPLE

8. STEM:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Waxy bloom: 1 = ABSENT 2 = PRESENT
[1] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT
[1] Internodes: 1 = HOLLOW 2 = SOLID
[0][4] NO. OF NODES *(Originating from node above ground)*
[1][7] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[1] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:
[1] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER *(Specify)*: _____
[1] Flag leaf: 1 = NOT TWISTED 2 = TWISTED
[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
[1][2] MM. LEAF WIDTH *(First leaf below flag leaf)*
[1][9] CM. LEAF LENGTH *(First leaf below flag leaf)*: 4

9300266

11. HEAD:

[1] Density: 1 = LAX 2 = DENSE

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

[2] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[2] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[9.5] CM. LENGTH

[13] MM. WIDTH

12. GLUMES AT MATURITY:

[2] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.)

[2] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

[4] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[1] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[2] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[1] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[4] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

[05] MM. LENGTH

[3.5] MM. WIDTH

[38] GM. PER 1000 SEEDS

17. SEED CREASE:

[2] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[2] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[2] STEM RUST (Races) see Table 4a

[2] LEAF RUST (Races) see Table 4b

[0] STRIPE RUST (Races) _____

[2] LOOSE SMUT

[2] POWDERY MILDEW

[0] BUNT

[2] OTHER (Specify) soil-borne mosaic

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY

[1] APHID (Bydv.)

[0] GREEN BUG

[1] CEREAL LEAF BEETLE

[---] OTHER (Specify) _____

HESSIAN FLY RACES: [2] GP [2] A [2] B [1] C [1] D [2] E [1] F [1] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Caldwell	Seed size	Caldwell
Leaf size	Caldwell	Seed shape	Caldwell
Leaf color	Caldwell	Coleoptile elongation	Caldwell
Leaf carriage	Caldwell	Seedling pigmentation	Caldwell

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

13 D. Exhibit D. Description of Additional Characteristics

1 grant ASA Nov 1994

~~P811670A9-10-6-7-63~~ is a common soft red winter wheat line. A significant contribution of P811670A9-10-6-7-63 is the combination of high yield potential and resistance to several important fungal diseases and soil borne mosaic virus.

P811670A9-10-6-7-63 is similar to the cultivar Caldwell for general plant type characteristics. P811670A9-10-6-7-63, however, has a higher yield potential, heads one to 2 days later, is 5 cm shorter, has stronger straw, and has a higher winter survival in Indiana than Caldwell (Tables 1 - 3). P811670A9-10-6-7-63 has genes *Sr31* (Table 4a) and *Lr26* (Table 4b). P811670A9-10-6-7-63 has resistance to powdery mildew from Kavkaz, and it has resistance to soil borne mosaic, wheat spindle streak mosaic, take-all, and Septoria leaf and glume blotches develop to less severity on P811670A9-10-6-7-63 than on Caldwell (Table 5). It also has gene *H5* for resistance to Hessian fly. Soft wheat milling and baking scores for P811670A9-10-6-7-63 are very good (Table 6).

Plant color of P811670A9-10-6-7-63 at booting is green, anther color is yellow; anthocyanin is absent in the stem, hairs of the last internode are absent, the stem has a waxy bloom, internodes are hollow; anthocyanin and hairs are absent on the auricles; the flag leaf is erect, not twisted, has a waxy bloom, and hairs are absent. Spikes of P811670A9-10-6-7-63 are lax, tapering, apically awnleted, and yellow at maturity. Glumes at maturity are of medium length and width, the shoulder is square, and the beak is obtuse. The coleoptile is white and seedling anthocyanin is absent. Juvenile plant growth is semi-erect. Seeds are ovate, cheeks are rounded; the brush length is medium, and not collared; phenol reaction is brown.

Table 1. Performance of selected wheat lines in nurseries at Lafayette, Indiana, 5-year period 1987-1991.[1]

Line/cultivar	Yield	Date headed	Test weight	Plant height	Straw score
	bu/A	May	lb/bu	cm	0-9[2]
~~811670A9-10-6-7-63~~	73.9	17.9	58.0	85.5	2.3
Auburn	65.5	19.3	58.8	92.1	--
Caldwell	68.9	16.0	57.9	90.0	3.8
Clark	71.0	14.0	57.9	93.4	3.1
LSD (.05)	6.2	1.1	1.3	3.9	0.5

[1] No data for 1992 due to severe winter kill.
[2] 0 = no lodging; 9 = lodged flat.

Table 2. Performance of selected wheat lines in nurseries at Sullivan, Indiana.

Line/cultivar	Yield	Date headed	Test weight	Winter survival
	bu/A	May	lb/bu	%
		1991		
~~811670A9-10-6-7-63~~	51.4	5	-	100
Clark	44.8	-1[a]	-	100
Caldwell	41.2	5	-	100
Auburn	37.5	9.5	-	100
		1992		
811670A9-10-6-7-63	53.7	12	62.4	63
Clark	37.9	7	61.6	46
Caldwell	33.7	10	62.6	34
Auburn	38.8	12	62.2	35
BLSD (k=100)	12.1			

[a] Clark headed on 30 April.

'Grant' named Mar 8 1994

Table 3. Means for ~~P811670A9-10-6-7-63~~ and its parent line P811670A9-10-6-7, and two cultivars as checks in the Uniform Advanced 4-State Soft Red Winter Wheat Nursery, 1989 and 1991.[1]

	Yield	Test weight	Date headed	Plant height	Lodging	Winter survival
	bu/A	lb/bu	May	in	%	%
			1989			
	(6)[2]	(6)	(4)	(6)	(6)	(6)
P811679A9-10-6-7	75.8	56.8	24	39	11	98
Cardinal	78.9	57.3	25	43	17	99
Auburn	70.6	58.9	25	41	13	98
			1991			
	(6)	(6)	(6)	(6)	(6) 0-9[3]	
P811670A9-10-6-7-63	40.4	50.3	12	36	1.9	--
Dynasty	38.7	51.8	11	39	2.2	--
Compton	38.8	54.6	11	38	2.7	--

1 Locations: Brownstown, Urbana, Illinois, 4 replications; Lafayette, Indiana, 4 replications; Columbia, Portageville, Missouri, 3 replications; Wooster, Ohio, 4 replications.

2 Numbers in parentheses are number of locations in means.

3 0 = no lodging, 9 = severe lodging.

Table 4a. Seedling reaction to entries of the 1992 Eastern Soft Red Winter Wheat Performance Nursery to selected isolates of Puccinia graminis f. sp. tritici. (D. V. McVey, USDA-ARS, Cereal Rust Laboratory, Univ. of Minnesota, St. Paul, MN. 55108)

No.	Line	Isolates							Postulated
		HNLQ	QFBS	QSHS	RKQS	RTQQ	TNMH	TNMK	Sr Gene
1	Knox 62	S	S	S	S	S	S	S	None
2	Cardinal	S	S	S	S	S	S	S	None
3	Caldwell	0;	2	S	S	0;	0;	S	17
4	79410D1-3-3-5-2-1	0;	S	S	S	0;	0;	S	17
5	8138I1-16-5-50	0;	S	S	S	0;	0;	S	17
19	~~811670A9-10-6-7-63~~*	1-	1	2-	2=	2=	2=	2=	31

'Grant' 12 Aug 1994

Table 4b. Seedling reaction of entries of the 1991-1992 Uniform Eastern Soft Red Winter Wheat Performance nursery to selected isolates of Puccinia recondita f. sp. tritici. (D. L. Long, USDA-ARS, Cereal Rust Laboratory, Univ. of Minnesota, St. Paul, MN. 55108)

No.	Cultivar or line	Reactions produced by Prt race *										Postulated seedling Lr genes **
		LBGB	JCDB	TCGG	TFGL	PLML	TBGL	FBRG	LBGQ	TDBL	SCDB	
1	Knox 62	3	3;	3	3	3	3	3	3	3	-	0
2	Cardinal	;3	;	;	3;	3;	3	;	3;	3;	-	10,+
3	Caldwell	3	3	3	3;	;3	3;	3	3	3	-	+
4	79410D1	3	3	3	3;	;	3;	3	3	3	-	+
5	813811	3	3	3	3	3	3	;2	3;	3;	-	+
19	~~811670A9~~	;	-	3	3	;	;	;	;	;	3	26

* Single Lr genes tested = 1, 2a, 2c, 3, 3ka, 9, 10, 11, 16, 17, 18, 24, 26, 30.

Virulence formula:

LBGB = Lr 1, 11
JCDB = Lr 2a, 2c, 17, 26
TCGG = Lr 1, 2a, 2c, 3, 11, 18, 26
TFGL = Lr 1, 2a, 2c, 3, 10, 11, 24, 26
PLML = Lr 1, 2c, 3, 3ka, 9, 10, 30
TBGL = Lr 1, 2a, 2c, 3, 10, 11
FBRG = Lr 2c, 3, 3ka, 11, 18, 30
LBGQ = Lr 1, 10, 11, 18
TDBL = Lr 1, 2a, 2c, 3, 10, 24
SCDB = Lr 1, 2a, 2c, 17, 26

**0 = no genes detected with these Lr virulence combinations; + = Lr gene (s) present but unable to identify with these Lr virulence combinations.

Table 5. Disease severity and reactions of selected wheat lines to diseases, Lafayette, IN.

Line/cultivar	1991 PM[1] 0-9[2]	SLB 0-9	LR (adult plant) %	LR (seedling) 0-4[3]	WSSM 0-9	SBM 8 May 0-9
~~811670A9-10-6-7-63~~	0	8.5	1MR[4]	0;	2.0	2.5
Caldwell	8.0	9.0	21	4	7.5	5.2
Auburn	7.8	7.8	0	1+	5.2	4.0
Howell	5.5	8.8	31S	--	5.5	--
Clark	5.3	9.0	30S	--	4.3	--

	1990 PM 24 May 0-9	SLB 12 June 0-9	SLB 20 June 0-9	LR all %	Take-all 0-9	BYDV 0-9
811670A9-10-6-7-63	1.0	6.0	--	tr	1,2	4,7,1
Caldwell	5.1	7.9	9.1	16.0	8,7	4,6,6
Auburn	3.7	6.4	8.2	0.1	7,5	4,5,5
Clark	3.0	7.0	--	--	5,8	3,3,1

[1] PM, powdery mildew; SLB, septoria leaf blotch; LR, leaf rust; SBM, soil borne mosaic; BYDV, barley yellow dwarf viruses.
[2] 0 = no disease symptoms, 9 = severe disease symptoms.
[3] 0 to 2 = resistance reaction; 3 to 4 = susceptible.
[4] R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible.

Table 6. Milling and baking qualities of selected wheat lines.

Line/cultivar	Milling score[a]	Baking score[a]
	1992	
Caldwell (Standard)	100A	100A
~~811670A9-10-6-7-63~~ Grant	97B	97B
Cardinal	94C	87D
Clark	81E	76F
Howell	93C	91C
	1991	
Cardinal (Standard)	100A	100A
811670A9-10-6-7-63	103A	95B
Caldwell	97B	85D
Clark	93C	98B
	1990	
Tyler (Standard)	100A	100A
811670A9-10-6-7-63	103A	99B
	1989	
Caldwell (Standard)	100A	100A
811670A9-10-6-7-63	98B	93C
Adder	93C	97B
Arthur	99B	88D
Clark	87D	89D
	1987	
Tyler (Standard)	100A	100A
811670A9-10-6-7-63	88D	97B
Adder	91C	91C

[a] All samples were evaluated at the USDA, ARS Soft Wheat Quality Laboratory, Wooster, Ohio. Milling score is in percent in relation to the standard and results from a weighted average of flour yield (50%), softness score (30%), test weight (10%) and ash (10%). Letter ratings A to F are added at 5% intervals of the milling score, e.g. A for 100 and above, B for 95 to 99.9, C for 90.0 to 94.9, etc.

[b] standard = cultivar from the same test chosen as the standard for comparison.

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Exhibit E. Statement of Basis of Applicant's Ownership

"Grant: was developed under leadership of Dr. H.W. Ohm. Dr. Ohm is an employee of Purdue University which claims ownership to intellectual property developed by its faculty.